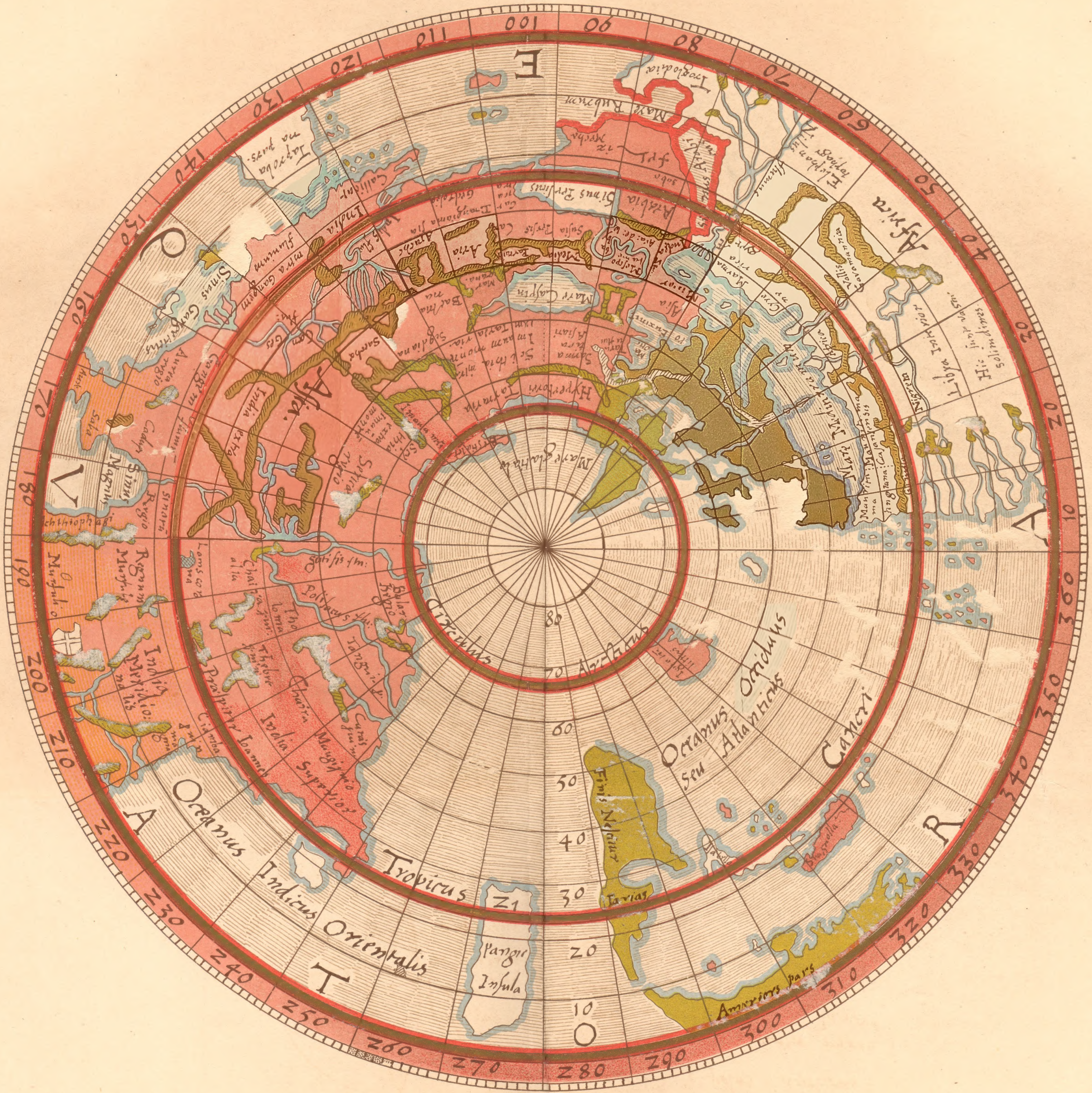

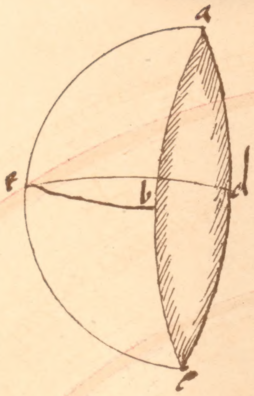

a b . c d aquator . e polus arcticus .
ea . ec . eb . ed . quattuor quartæ meri-
dianorū a polo ad aquatorem . Jacet
ergo prior formula in plano . cuius volum
eleuatum possumus intelligere tanquam
superius hemisphærium .

GLAREANUS.

By MAJOR C. F. CLOSE, C.M.G., R.E.

THE *De Geographia Liber* of Glareanus, printed in Basle in 1527, is well known to those interested in geographical studies. But it is only recently that the original manuscript has been discovered. This manuscript is bound up with other sixteenth-century and seventeenth-century manuscripts in a volume which is now in the possession of Major-General E. Renouard James (late R.E.). The ownership of the volume can be traced back to Jean Henri Ott (1617—1682), Major-General James's direct ancestor.

Heinrich Loriti, called Glareanus from his birthplace in the Canton of Glarus, was born in 1488 and died at Freyburg in 1563. He was "one of the early promoters of physical science, a scholar and a man of very varied learning." He was a friend of Erasmus, and the volume contains a letter, dated 1516, written to him by Erasmus. We get a glimpse of their friendship in Froude's *Life and Letters of Erasmus:* "His (Paul III.'s) first act on his accession had been to make advances to Henry VIII. . . . He sent the Cardinal of St. Angelo to Germany to feel his way towards a reconciliation. In Clement's time Erasmus had been denounced, as he complained, in every church and at every dinner. The Cardinal of St. Angelo now sent him profuse compliments along with a handsome present." 'The Cardinal (wrote Erasmus at Freyburg, 9th January, 1535) has given me a magnificent gold cup as a sign of his good will. I produced it for my friends Glareanus and Rhenanus, who were dining with me.'

Mr. E. Heawood has shown that the manuscript was probably written about the year 1510, seventeen years before the book was printed at Basle.

It will be interesting to note the state of cosmographical knowledge in the year that the treatise was written. Columbus had discovered the new world eighteen years before, and the spherical shape of the earth was an accepted fact; but the conception of the universe as a whole was still very primitive. Glareanus gives a diagram in which the earth occupies the centre; the sun and planets revolve round the earth after the elements of Air, Fire and Water; there is then the 9th Heaven, the Aqueous or Crystalline Sphere; the 10th Heaven, the "primum mobile"; the fixed stars; and the Cerulean Sphere, or abode of the Souls of the Blessed Departed, outside of all. In the description of this planetary system occurs the quaint phrase, "the spheres slide loosely over each other like the skins of an onion."

Copernicus was at this time working at the planetary motions, but his book *De Orbium Cœlestium Revolutionibus* was not published till 1543. Until this date the onion theory held the field, and indeed it did not finally vanish from certain conservative institutions for nearly three centuries.

The treatise consists of forty-five pages of paper, about the size of a sheet of foolscap, written on both sides. The work is entirely in Latin and the writing is beautifully clear. There are numerous illustrations in the body of the text and seven full-page maps in colours; a reproduction of one of these, the map of the Northern Hemisphere, forms the frontispiece of this number of the *R.E. Journal.* Great care has been taken to make the reproduction as exact as possible, but the aged appearance of the paper, resulting from the passage of four centuries, has not been imitated; the reproduction must closely represent the appearance of the original as it came fresh from the old geographer's hands.

The principal headings of the chapters into which the book is divided are: De Geometriæ Principiis; De Partibus Essentialibus Totius Universi (illustrated by a diagram of the celestial spheres arranged on the onion theory); De Motibus Corporum; Quid Sphæra, Axis, Poli, et Polorū Nomina; Quid per Elevationem Poli Intelligatur; De Parallelis; De Climatum Ratione; De Latitudine; De Longitudine; De Ventis; De Pictura Globi; De Inducenda Bapyro in Globo; De Divisione Terræ; De Europa; De Regionibus Quæ Libro Sunt Apud PTOLEMÆUM.

The chapter last mentioned commences with an account of Ireland:—HYBERNIA insula maxime ad occasum et septentrionem, a septentrione Hyperboreo alluitur oceano. . . . Hodie dicitur Irland. Paret hodie Anglorū regi. Homines sunt agrestes.

The description of the various countries of Europe is followed by similar accounts of Africa and Asia, and at the end of the book there are a few lines on the newly discovered land called America: "Sūt qui putent tempore Augusti Cæsaris eam terrā quoq fuisse notā." . . .

To modern readers the most interesting features of the treatise are the map projections used. There are seven full-page maps. Three of these are on a projection of which, on account of the comparative roughness of the drawing, it is difficult to discover the exact law. It is a modification of a projection used in previously published editions of Ptolemy. The parallels are circles but are not concentric; the meridians are circles and the lengths along the meridians are true.

The other projections are more important. One is a conical projection with rectified meridians; the pole is the centre of the parallels and there is one standard parallel. This projection was copied from Ruysch (1508). The result is two fan-shaped maps, stretching from the North Pole to 37° S., each showing 180° of longitude. The angle at the pole is 108°, and the parallel 5° S. is therefore true to scale. This is an early instance of the use of that important projection "Conical, with Rectified Meridians and Two Standard Parallels"; in this case the pole is one of the standard parallels.

The other projection is the "Equidistant Polar Projection." Glareanus shows two maps on this projection, one of the Northern Hemisphere (see *Frontispiece*) and one of the Southern. This is the first known instance of the use of the Equidistant Projection.

None of the projections used are derived from the sphere by any obvious geometrical process, and it would have been well if modern map-makers had always followed this excellent example.

The writer of this note is much indebted to Major-General Renouard James for so kindly lending the manuscript, and for permitting the reproduction of the map.

THE
ROYAL ENGINEERS
JOURNAL.

VOLUME I.

JANUARY TO JUNE, 1905.

CHATHAM:
ROYAL ENGINEERS INSTITUTE.
AGENTS AND PRINTERS: W. & J. MACKAY & CO., LTD.